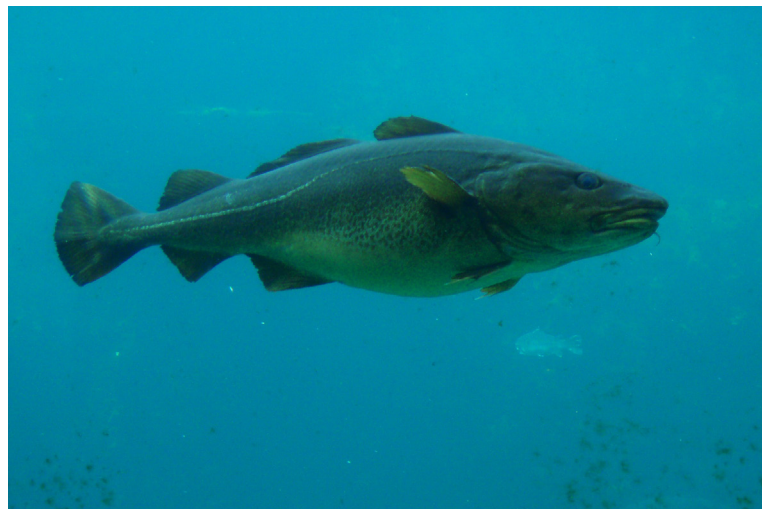




Background Document for Atlantic cod *Gadus morhua*



## OSPAR Convention

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR Convention") was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. It has been ratified by Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom and approved by the European Community and Spain.

## Convention OSPAR

La Convention pour la protection du milieu marin de l'Atlantique du Nord-Est, dite Convention OSPAR, a été ouverte à la signature à la réunion ministérielle des anciennes Commissions d'Oslo et de Paris, à Paris le 22 septembre 1992. La Convention est entrée en vigueur le 25 mars 1998. La Convention a été ratifiée par l'Allemagne, la Belgique, le Danemark, la Finlande, la France, l'Irlande, l'Islande, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni de Grande Bretagne et d'Irlande du Nord, la Suède et la Suisse et approuvée par la Communauté européenne et l'Espagne.

## Acknowledgement

The Background Document has been prepared by the 'Marine and Coastal Nature Conservation Unit' of the German Federal Agency for Nature Conservation (BfN) in cooperation with Dr Ronald Fricke, Staatliches Museum fuer Naturkunde, Stuttgart, Germany with contributions from the European Commission, Iceland and Norway.

[Photo acknowledgement](#)

[Cover page: Wikipedia](#)

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# OSPAR Background Document on Atlantic cod *Gadus morhua*

## Executive Summary

This background document on Atlantic cod *Gadus morhua* has been developed by OSPAR following the inclusion of this species on the OSPAR List of threatened and/or declining species and habitats (OSPAR Agreement 2008-6). The document provides a compilation of the reviews and assessments that have been prepared concerning this species since the agreement to include it in the OSPAR List in 2003. The original evaluation used to justify the inclusion of *G. morhua* in the OSPAR List is followed by an assessment of the most recent information on its status (distribution, population, condition) and key threats prepared during 2009-2010. Chapter 7 provides proposals for the actions and measures that could be taken to improve the conservation status of the species. In agreeing to the publication of this document, Contracting Parties have indicated the need to further review these proposals. Publication of this background document does not, therefore, imply any formal endorsement of these proposals by the OSPAR Commission. On the basis of the further review of these proposals, OSPAR will continue its work to ensure the protection of *G. morhua*, where necessary in cooperation with other competent organisations. This background document may be updated to reflect further developments or further information on the status of the species which becomes available.

## Récapitulatif

Le présent document de fond sur le cabillaud a été élaboré par OSPAR à la suite de l'inclusion de cette espèce dans la liste OSPAR des espèces et habitats menacés et/ou en déclin (Accord OSPAR 2008-6). Ce document comporte une compilation des revues et des évaluations concernant cette espèce qui ont été préparées depuis qu'il a été convenu de l'inclure dans la Liste OSPAR en 2003. L'évaluation d'origine permettant de justifier l'inclusion du cabillaud dans la Liste OSPAR est suivie d'une évaluation des informations les plus récentes sur son statut (distribution, population, condition) et des menaces clés, préparée en 2009-2010. Le chapitre 7 fournit des propositions d'actions et de mesures qui pourraient être prises afin d'améliorer l'état de conservation de l'espèce. En se mettant d'accord sur la publication de ce document, les Parties contractantes ont indiqué la nécessité de réviser de nouveau ces propositions. La publication de ce document ne signifie pas, par conséquent que la Commission OSPAR entérine ces propositions de manière formelle. A partir de la nouvelle révision de ces propositions, OSPAR poursuivra ses travaux afin de s'assurer de la protection du cabillaud, le cas échéant avec la coopération d'autres organisations compétentes. Ce document de fond pourra être actualisé pour tenir compte de nouvelles avancées ou de nouvelles informations qui deviendront disponibles sur l'état de l'espèce.

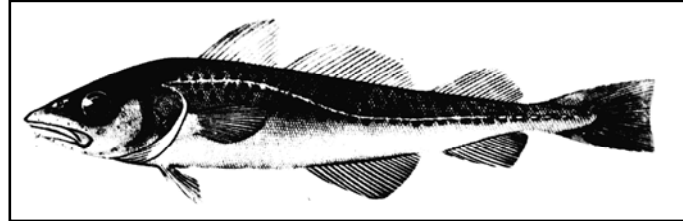
## 1. Background Information

### Name of species

Atlantic cod (*Gadus morhua*)

Linnaeus 1758

**Figure 1**  
**Atlantic cod (*Gadus morhua*)**  
Source: Whitehead et al. 1986



## 2. Original evaluation against the Texel-Faial selection criteria

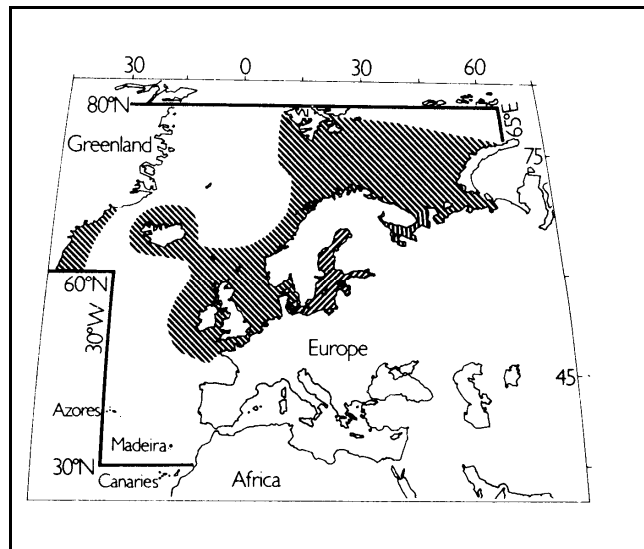
### List of OSPAR Regions where the feature occurs

**OSPAR Regions:** I, II, III, IV, V

**Dinter Biogeographic Zones:** Warm-temperate waters, Cold-temperate waters, Cold-Arctic waters, Warm-temperate pelagic waters, Azores shelf, Lusitanian (Cold/Warm), Lusitanian-boreal, Cold-temperate pelagic waters, Boreal-lusitanian, Seamounts and plateaus, Boreal, Norwegian Coast (Finnmark), Norwegian Coast (Westnorwegian), Norwegian Coast (Skagerrak), South Iceland - Faroe Shelf, Southeast Greenland, North Iceland Shelf, Northeast Greenland Shelf (incl. NEWP), High Arctic Maritime, Barents Sea.

**Figure 2**  
**Distribution of Atlantic cod (*Gadus morhua*) in the North-East Atlantic including the OSPAR Maritime Area**

Source: Whitehead et al. 1986



### List of OSPAR Regions and Dinter biogeographic zones where the feature is under threat and/or in decline

**OSPAR Regions:** The OSPAR List identifies *G.morhua* as under threat and/or in decline in Regions II and III where it occurs, specifying the following populations/stocks in Regions II and III as referred to in ICES advice: “North Sea, Eastern Channel and Skagerrak cod”, “Kattegat cod”, “Cod west of Scotland”, “Cod in the Irish Sea”, “Cod in the Irish Channel and Celtic Sea”.

This updated assessment concludes that some stocks of *G.morhua* are also under threat and/or in decline in Region I: “Norwegian coastal waters cod”, “Faroe Plateau cod”, “Faroe Bank cod”.

**Dinter Biogeographic Zones:** Cold-temperate waters, Cold-Arctic waters, Cold-temperate pelagic waters, Boreal, Norwegian Coast (Finnmark), Norwegian Coast (Westnorwegian) , Norwegian Coast (Skagerrak), South Iceland - Faroe Shelf, Southeast Greenland, North Iceland Shelf, Northeast Greenland Shelf (incl. NEWP), High Arctic Maritime, Barents Sea.

### Original evaluation against the Texel-Faial criteria for which the feature was included on the OSPAR List of threatened and/or declining species and habitats

Criterion	Comments	Evaluation
Global importance	Distributed in North Atlantic including Baltic Sea.	Does not qualify
Regional importance	Distributed over all Regions within the OSPAR Maritime Area.	Does not qualify
Rarity	Not rare.	Does not qualify
Sensitivity	Sensitive to fisheries and very slow to recover from depletion.	Qualifies
Keystone species	Top-predator historically shaping and stabilising its respective ecosystems.	Qualifies
Decline	Several stocks severely declined to about 5 % or less of the original population.	Qualifies

## 3. Current status of the species

### Distribution in OSPAR Maritime Area

*G.morhua* is a benthopelagic species, distributed in a variety of habitats, from the shoreline down to the continental shelf and beyond to depths of 600 m. The species forms large schools during the day, and performs seasonal (spawning and wintering) migrations. Several spawning grounds of different stocks have been identified. In the OSPAR Maritime Area, the species is found from Greenland and Iceland to the Barents Sea, and south to the English Channel and the Celtic Sea (Fricke 1987, 2007, Cohen et al. 1990, Anonymous 1998, Campana et al. 1999, Vandeperre & Methven 2007, Fox et al. 2008, OSPAR 2008, Eschmeyer & Fricke 2009, Froese & Pauly 2009). It also occurs in the Western North Atlantic and the Baltic Sea; the Baltic Sea cod may be a separate taxonomic entity (Pogson et al. 1995, 2001, Nielsen et al. 2003).

In the North-East Atlantic, the Norwegian-Arctic stock in the Barents Sea, the Icelandic stock and the much smaller North Sea stock range widely. There are also local, stationary races which always remain close inshore (Knutsen et al. 2003, Svedäng 2003, OSPAR 2008).

### Population (current/trends/future prospects)

*G.morhua* stocks are genetically isolated from each other. In North-western Atlantic stocks, a considerable genetic heterogeneity was found (Beacham et al. 2002). In the western Baltic Sea, hybrid zones between stocks were observed (Nielsen et al. 2003). North-eastern Atlantic stocks are supposed to be likewise heterogenic, and should be treated as separate entities.

The Atlantic cod is a species with a high fluctuation in abundance. It is a typical pattern for this species that increasing stocks are followed by depletions. In the so-called 'gadoid outburst' in the 1970s cod and other gadoid species had a relatively high abundance, possibly due to exceptional circumstances. However, considering the long-term population development over 100-150 years, clearly a severe overall depletion has occurred in almost all cod populations/stocks.

As of today, most of the cod stocks in the North-East Atlantic are fully exploited or depleted as a result of unsustainable removal in target fisheries. In general, the rebuilding of depleted stocks has been slow, and in many cases promising increases in abundance in the 1980s or 1990s have not resulted in lasting improvements in stock status.

One important exception is, however, the North-East Arctic cod stock which ICES classifies as having full reproductive capacity and being harvested sustainably (ICES 2009a).

#### **Example 1: Cod in the North Sea**

From the beginning of the previous century until the 1960s, landings of cod fluctuated between 50 000 tonnes and 100 000 tonnes in the North Sea. In the 1960s landings increased and reached a maximum of 350 000 tonnes in 1972. They then declined steadily from 1981 to 1991, since when they have shown a small increase to 140 000 tonnes in 1995. Total catch of North Sea cod reached its peak in 1980 with 590,678 t. In 1981, the catch dropped drastically to 393,451 t. Total catch declined further during late 1980s to early 1990s, then increased slightly during 1990s and has fluctuated around a declining trend since then. The reported landings of cod in IIIa (Skagerrak), IV (North Sea), and VIId (Eastern Channel) in 2008 were 26.8 thousand t and the estimated discards were 21.8 thousand t. When additional estimated removals are added, the total catch is of 90.7 thousand t (ICES 2009b).

The 1997–2008 year classes are all estimated to be well below average. The 2005 year class is estimated to be one of the most abundant amongst the recent below-average year classes but the 2008 class to be one of the lowest yet registered (ICES 2009b).

Based on present fishing mortality (0.41) in relation to that which would ensure high long-term yield the stock is also classified as being overfished (ICES 2009b). SSB has increased since its historical low in 2006 but remains below  $B_{lim}$  (70,000 t) (Anonymous 2009b).

All the indications are that the current exploitation rate for cod in the North Sea is not sustainable and that a collapse of the stock is possible, unless there is a significant reduction in fishing pressure to bring the stock within Safe Biological Limits (IMM 1997, Larsen et al. 1997, Ruzzante et al. 1997, Fromentin et al. 2000, Svedäng 2003, Svedäng & Bardon 2003, Cardinale & Svedäng 2004, Hjermmann et al. 2004, Storr-Paulsen et al. 2004, WWF 2004, Pampoulie et al. 2005, Lilly et al. 2008, OSPAR 2008, Nielsen et al. 2009).



**Figure 3**  
**Set TACs vs. actual catch**  
**of North Sea cod (Subarea**  
**IV only, 1987-2010)**  
**Note: Scientific advice**  
**from 1991-1995 was**  
**defined in terms of effort.**  
**For 2001-2007 and 2009, a**  
**zero catch was advised.**  
 Source: ICES (2009b)



**Example 2: Cod in the North East Arctic**

Regarding Arctic cod and haddock, the joint Norwegian–Russian Fisheries Commission has adopted a rule for setting the annual total allowable catch for these species. The rules are based on a moderate level of fishing mortality. The Norwegian Arctic cod stock appears to be the cod stock which is in the best shape globally. For 2010, on the basis of stock assessments from ICES and agreed management strategies, the TAC for cod is 607 000 tons. Marine scientists have estimated the trend in the population under the assumption that fisheries strictly adhere to the management strategy. Such simulations show that the spawning stock of Norwegian Arctic cod will be over a million tons in 2010, and approximately one and a half million tons in 2011 (ICES 2009a).

**Condition (current/trends/future prospects)**

The FAO classified the status of Eastern North Atlantic (Fishing area 27) cod stocks ranging from fully exploited to depleted (FAO 2008).

*ICES (2009a) has reported the current status of the different stocks of cod previously identified by OSPAR as being under threat and/or in decline as follows:*

**Kattegat cod (Division IIIa East Kattegat)**

Based on the most recent estimates of the Spawning Stock Biomass (SSB) (in 2009) ICES classifies the stock as suffering reduced reproductive capacity. The SSB trend indicates a fivefold decrease since 1970 and SSB has been at a historically low level since the early 2000s. Current level of fishing mortality is unknown. Recruitment in recent years has been the lowest in the time series.

**Cod in the North Sea, eastern Channel and Skagerrak (IV, VIId, and IIIa)**

Based on the most recent estimate of SSB (in 2009) and fishing mortality (in 2008), ICES classifies the stock as suffering reduced reproductive capacity and as being at risk of being harvested unsustainably (overfished). SSB has increased since its historical low in 2006, but remains below Blim. Fishing mortality declined after 2000, but in 2008 increased, predominantly as a consequence of increased discarding and is currently estimated to be between Flim and Fpa.

**Cod west of Scotland (VIa)**

Based on the most recent estimates of SSB (in 2009) ICES classifies the stock as suffering reduced reproductive capacity. Total mortality is high, but cannot be accurately partitioned into fishing mortality



and natural mortality. The spawning stock biomass has increased from an all time low in 2006, but remains well below Blim. Recruitment has been estimated to be low over the last decade.

### **Cod in the Irish Sea (VIIa)**

Based on the most recent estimates of SSB (in 2009), ICES classifies the stock as suffering reduced reproductive capacity. Based on the most recent estimate of fishing mortality (in 2008), ICES classifies the stock as being harvested unsustainably.

### **Cod in the Celtic Sea (VIIe–k)**

The available information on landings, Catch Per Unit Effort (CPUE), surveys, and stock structure are inadequate to establish reliable assessments and evaluate stock trends. Therefore the state of the stock is unknown and there is no basis for quantitative advice.

*ICES (2009a) has reported the current status of other stocks of cod that occur in the OSPAR Maritime Area as follows:*

### **Cod in Norwegian coastal waters (Subareas I and II)**

In the absence of defined precautionary reference points the state of the stock cannot be fully evaluated. Survey trends in combination with reported landings indicate that the SSB is close to the lowest observed level. Recruitment declined over the period 1995 - 2002 and has remained low since. Recruitment is clearly impaired at present SSB. Fishing mortality is unknown, and the harvest rate (proxy for fishing mortality) has increased in 2008 after a decline in recent years.

### **Icelandic Cod (Va)**

The spawning stock reached a historical low in 1993 (120 000 t) but has since then increased and is estimated to be 300 000 t at present. The current value is very low compared to the early historic period. Fishing mortality has declined significantly and is presently the lowest observed in 40 years. ICES advises that the Icelandic cod management plan has a high probability of resulting in an increase in the size of spawning stock from the current estimated level by 2015 and beyond. In addition, the plan is consistent with the precautionary approach and the medium-term projected fishing mortality is consistent with international commitments to achieve maximum sustainable yield (high long-term average yield,  $F_{max} = \sim 0.3$ ).<sup>1</sup>

### **Faroe Plateau cod (Vb1)**

Based on the most recent estimates of SSB (in 2009) and fishing mortality (in 2008), ICES classifies the stock as suffering reduced reproductive capacity and as being harvested unsustainably. Most year classes from 2001 onwards have been around one third of the long-term average. ICES advises to close fisheries on this stock.

### **Faroe Bank cod (Vb2)**

Because of the very low stock size, ICES advises that the fishery should be closed. Reopening the fishery should not be considered until both survey indices indicate a biomass at or above the average of the period 1996-2002.

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<sup>1</sup> ICES advice on the Icelandic cod stock in 2010 is available at:

<http://www.ices.dk/committe/acom/comwork/report/2010/2010/cod-iceg.pdf>

ICES revision on the Icelandic harvest control rule (January 2010) is available at:

<http://www.ices.dk/committe/acom/comwork/report/2010/Special%20Requests/Icelandic%20cod%20management%20plan.pdf>

### Northeast Arctic cod (I and II)

Based on the most recent estimates of SSB and fishing mortality, ICES classifies the stock as having full reproductive capacity and being harvested sustainably (ICES advice 2008).

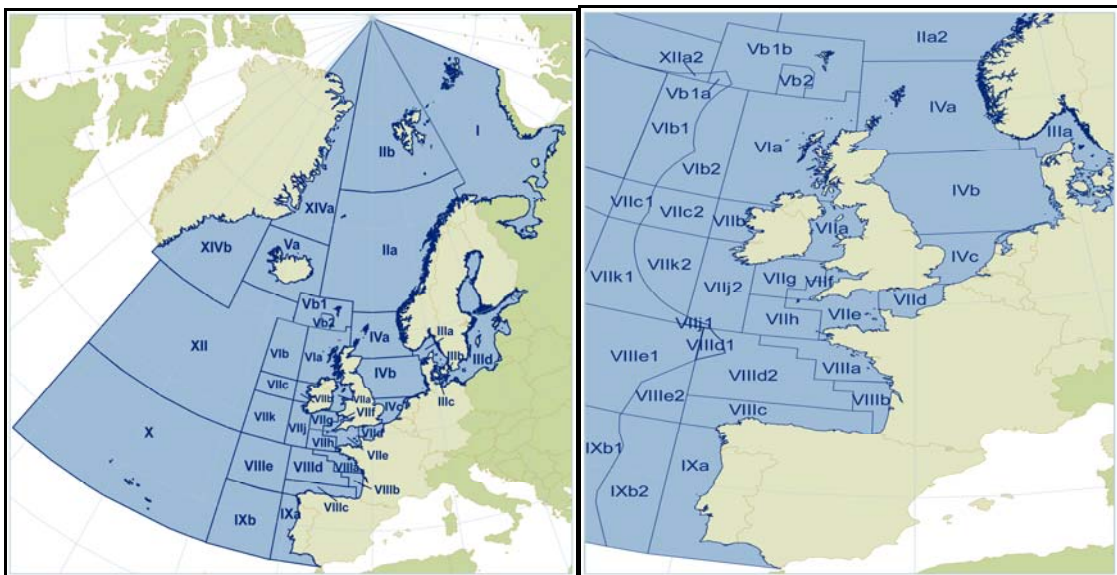
### Synopsis

The ICES evaluation in 2009 (above) states that all except the Northeast Arctic cod and the Icelandic cod are outside Safe Biological Limits (SBL) at the present time and that the Spawning Stock Biomass (SSB) for the Celtic Seas cod have yet to be determined.

It is reasonable to consider that stocks need to be at least above Safe Biological Limits not to qualify as being threatened or declining, and that they are not being harvested outside such limits.

Consequently, in addition to the cod stocks in OSPAR Regions II and III that have been identified by OSPAR to be under threat and/or in decline in the original evaluation (2008), it now seems justified to also consider the other stocks listed above – with the exception of the Northeast Arctic cod and the Icelandic cod - to be at least under threat (see also Section 6).

**Figure 4** ICES Fishing Areas



### Limitations in knowledge

There is a substantive amount of information on the status of the different cod stocks in the OSPAR Maritime Area from surveys and landings data. These go back for many decades and have been used by ICES to assess the status of the different stocks.

The age-based stock assessment model B-ADAPT has been used in the assessment of North Sea stocks. Since the information on landings and effort are considerably unreliable, commercial indices were not used in the assessment. Instead, the assessment uses only survey data for calibration. Despite their obligation under EU data collection regulations, many countries with substantial cod landings have not supplied discarding estimates. This is a source of added uncertainty in the assessment (ICES 2009b).

Quantities of additional unallocated removals were estimated by the model on the basis of the total mortality indicated by the survey. Unallocated removal estimates could potentially include components due to increased natural mortality and discarding as well as unreported landings. It is, however, assumed that these removals do originate in fishing activities (ICES 2009b).

Natural variability is likely to have contributed to the changing status of cod. The evidence that depletion of food supplies and global warming have played an important role in declines of cod stocks is nevertheless incomplete and sometimes speculative (Castonguay *et al.* 1999, Björnsson *et al.* 2001, Fischer 2003, Ruzicka 2004, Drinkwater 2005, Brander 2006, Nielsen *et al.* 2007). No evidence for effects of climate change on cod stocks in the southern part of the range in the north-western Atlantic was found by Nielsen *et al.* 2007. Although cod stocks are clearly affected by ocean conditions and food supply, evidence that these factors would have caused major declines in cod stocks, without overfishing, is weak (ICES 2002a).

#### 4. Evaluation of threats and impacts

By far the largest threat to cod stocks comes from fisheries (Rose *et al.* 2000, Froese & Pauly 2003, Handegard *et al.* 2003, Harvey *et al.* 2003, Sellers 2003, Cardinale & Svedäng 2004, Suuronen *et al.* 2007, Urbach & Cotton 2008). This is due to overfishing in directed fisheries (ICES 2009a) as well as by-catch in mixed fisheries where juvenile cod in particular may be caught and then discarded. While Norway and Iceland have a discard ban, the EU has not. The scale of this threat is very significant. In the North Sea, for example, the combination of the very high exploitation rate and the relatively advanced age at which cod mature (3 to 6 years) means that less than 1 % of the 1-year-old fish in the North Sea are believed to survive to reach maturity. Depletion of food sources and global warming has also been suggested as contributory factors in the decline but any effects are likely to be minor compared to that from fishing. Higher sea surface temperatures may, however, affect local recovery of cod stocks.

<b>Type of impact</b>	<b>Cause of threat</b>	<b>Comment</b>
Fisheries	Target and by-catch fisheries.	Major impact, see above.
Climate change	Human induced global warming	Moderate to minor impact, possible shifting of distribution range due to rising sea temperatures.
Habitat damage	Mobile fishing gears, pollution	Minor impact compared with mortality in fisheries.

## 5. Existing management measures

The information on the management of cod stocks provided in this section is not considered to be all-encompassing. Rather, this section aims to highlight some of the most important regulatory measures that have been adopted by the respective authorities competent for fisheries management for the cod stocks as defined by the International Council for the Exploration of the Sea (ICES). Emphasis is given to management of those cod stocks that have been identified in the OSPAR List of threatened and/or declining species and habitats; namely North Sea and Skagerrak cod stock, Kattegat cod stock, Cod west of Scotland, Cod in the Irish Sea, Cod in the Irish Channel and Celtic Sea.

Further and comprehensive information can be obtained at

- The European Commission ([http://ec.europa.eu/fisheries/cfp/index\\_en.htm](http://ec.europa.eu/fisheries/cfp/index_en.htm))
- Norwegian Ministry of Fisheries and Coastal Affairs (<http://www.regjeringen.no/en/dep/fkd.html?id=257>)
- Icelandic Ministry of Fisheries and Agriculture (<http://www.fisheries.is/>)

### General cod fisheries management

#### Long-term management plan

In general, the management of cod stocks in (a) the Kattegat, (b) the North Sea, Skagerrak, and eastern Channel, (c) west of Scotland, and (d) the Irish Sea is regulated by Council Regulation (EC) No 1342/2008 of 18 December 2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004. The plan shall ensure the sustainable exploitation of these cod stocks on the basis of maximum sustainable yield. The North Sea cod stock is shared with Norway and is jointly managed. The measures provided for in this Regulation should therefore take due account of consultations with Norway pursuant to the Agreement on fisheries between the European Economic Community and the Kingdom of Norway.

The long-term management plan for these cod stocks replaced biomass-based objectives with a target fishing mortality of 0.4, and aimed at subsequently managing the stocks based on maximum sustainable yield (Anonymous 2009b). The plan includes a regime of effort for all the fishing vessels (except pelagic) operating in these areas. Biomass targets (Blim and Bpa) are used as a trigger to define the reduction of fishing mortality.

This will allow genuine conservation measures to be taken where they are most needed, while helping the industry benefit from recovery once it has taken root. TACs can not be reduced or increased by more than 20%. When the EC Scientific, Technical and Economic Committee for Fisheries (STECF) do not dispose of adequate data to advise a TAC according to the rules established in the long-term management plan, TACs should be reduced by at least 25 % if a reduction of catches is considered necessary. As the North Sea cod is a jointly managed stock, the TAC is formally set in negotiations between EU and Norway.

The long-term management plan was evaluated by ICES in 2009 and found, assuming adequate implementation and enforcement, to be in accordance with the precautionary approach. The evaluation is most sensitive to implementation error, i.e. TAC and effort overshoots and subsequent increases in discarding, and to continued low recruitment. Under these scenarios, the effectiveness of the plan could be undermined and recovery delayed until after 2015 (Anonymous 2009b, ICES 2009b).

## Discards

Official landings consistently comply with the set TACs, but discards have accounted in 2007 and 2008 for approximately equal fishing mortality to that due to landings. There are also strong indications of unaccounted removals due to other sources, presumed to be fishing-related. These are thought to be increasing and to have accounted in 2008 for removals comparable to summed landings and counted discards (Anonymous 2009b, ICES 2009b). This highlights the need for urgent improvements in implementation and enforcement (Anonymous 2009b, ICES 2009b).

Assessment estimates and reports from some fisheries indicate that, historically, quota restrictions have not been effective in controlling the catch of cod. Since 1992, TACs were set by managers to substantially reduce F and discarding, and were accompanied by an increasing number of technical measures and effort limitations (since 2003) imposed on the fisheries targeting cod. However, effort restrictions in the smaller mesh size fisheries, which have significant discards, have been less stringent. Recent reports indicate that increased levels of discarding are also being recorded. The issue of large discards was addressed by the UK in 2008, noting an increasing trend for the discarding of marketable sized fish due to lack of quotas considering high abundance of cod and requesting an alteration in management strategy. The new management plan encourages the adoption of cod-avoidance and discard-reduction programmes (EU 2008b). Considerable efforts have since been made by some countries to reduce discards but it is too early to evaluate their effectiveness. ICES notes that the effectiveness must be monitored to allow for additional and timely technical, seasonal or spatial measures to be introduced (Anonymous 2009b, ICES 2009b).

<b>Table 3: Total Allowable Catches (TAC) and landings (tonnes) of Cod (<i>Gadus morhua</i>) for EU managed stocks in the North Atlantic 2008-2009<sup>2</sup></b>					
<b>Source:</b> <a href="http://ec.europa.eu/fisheries/press_corner/press_releases/2008/com08_77_table_en.pdf">http://ec.europa.eu/fisheries/press_corner/press_releases/2008/com08_77_table_en.pdf</a>					
<b>Species (Common name)</b>	<b>Species (Latin name)</b>	<b>ICES fishing zone</b>	<b>TACs 2009 Final</b>	<b>Difference with TACs 2008</b>	<b>Commission proposals for TACs 2009</b>
Cod	<i>Gadus morhua</i>	Ila (EC), North Sea (EC)	22512		pm
Cod	<i>Gadus morhua</i>	Kattegat	673	-25,0%	505
Cod	<i>Gadus morhua</i>	Norwegian waters S of 62	nr		pm
Cod	<i>Gadus morhua</i>	Skagerrak	3165		pm
Cod	<i>Gadus morhua</i>	Vb(EC) VI,XII,XIV	402	-25,0%	302
Cod	<i>Gadus morhua</i>	Vla, Vb	402	-24,9%	302
Cod	<i>Gadus</i>	VIb (Rockall subunit)	0		62

<sup>2</sup> Table 3 excludes TACs set for shared stocks or for stocks managed by other management arrangements. The TAC for North-East Arctic cod is 607 000 t for 2010.

	<i>morhua</i>				
Cod	<i>Gadus morhua</i>	VIIa	1199	-25,0%	899
Cod	<i>Gadus morhua</i>	VIIb,c,e-k, VIII,IX,X,CECAF 34.1.1 (EC)	4316	25,2%	5404
Cod	<i>Gadus morhua</i>	VIIId	n. a.		pm
<b>nr:</b> not relevant					
<b>pm:</b> stock subject to negotiation with third countries, or advice not yet available.					
<b>n. a.:</b> not applicable					

#### Minimum mesh size

In 2001, cod in the whole of NEAFC Region 2 was a legitimate target species for towed gears with a minimum cod-end mesh size of 100 mm.

As part of the cod recovery measures, the EU and Norway introduced additional technical measures starting 1 January 2002 (EC 2056/2001). The basic minimum mesh size for towed gears for cod from 2002 was 120 mm, although in a transitional arrangement until 31 December 2002, vessels were allowed to exploit cod with 110 mm cod-ends provided that the trawl was fitted with a 90 mm square mesh panel and the catch composition of cod retained on-board was not greater than 30 % by weight of the total catch. From 1 January 2003, the basic minimum mesh size for towed gears targeting cod was 120 mm. The minimum mesh size for vessels targeting cod in Norwegian waters south of 62°N is also 120 mm. North of 62°N the minimum mesh size is 135 mm.

The expected benefits from the increase in mesh size to 120 mm are not apparent from the available data as a changed pattern of mesh size use in demersal trawls has emerged, with increases in the use of larger mesh sizes and more pronounced effort in vessels using smaller meshes (Anonymous 2009b, ICES 2009b).

#### Management of cod in the North Sea

On 13 July 2007, the Community Fisheries Control Agency (CFCA) adopted an operational plan for joint multi-national fishery controls in the North Sea and adjacent areas (Anonymous 2007). This marked the start of an innovative and coordinated effort to combat over-fishing and save endangered cod stocks. This joint deployment plan for the North Sea pooled resources (inspectors, control vessels, aircraft, etc) from seven coastal EU Member States and used them to ensure more effective and uniform control of fishing activities. The plan, which consisted of seven cross-border inspection and surveillance campaigns, was running until the end of the year 2007. Similar plans will be put in place in the other EU fishing areas.

Although the scientific authorities suggested zero catch for North Sea cod from 2001 until 2007, the managers still set TACs for those years, although following a decreasing trend. Based on the assessment in October 2007, ICES advised that a TAC be set at less than 22 000 tonnes for 2008; in response, the managers set the TAC in 2008 at 22 200 tonnes.

In the North Sea, a cod protection area was implemented in 2004 (EC 2287/2003, amended in EC 867/2004) which defined the conditions under which certain stocks, including haddock, could be



caught in Community waters. A maximum of 35 % of the haddock TAC in 2004 could be taken from within the cod protection area. For the UK, a special permit was required to fish for haddock in the cod protection area. Although this management scheme was proposed to permit additional haddock to be caught in 2004, the requests for special permits were relatively few. This cod protection area was only in force in 2004 as, similarly to 2001's closure, the desired effects were not achieved (ICES 2009b).

Real time closures are regularly put in place since 2008, for example set by Scotland and England in the North Sea and France in the eastern Channel. Fishing areas, where abundance of mature or juveniles of cod are detected, are closed for a period of 21 days.

Spatial and temporal fishing area closures were implemented in the Kattegat in January 2009 in order to reduce fishing mortality on cod. The effects of the spatial restrictions on cod recovery will be evaluated in three years time after the implementation.

### **Management of cod stocks by Norway**

With regard to Norwegian coastal cod, Norway has recently requested ICES to evaluate a new recovery plan.<sup>3</sup>

### **Management of cod stocks by Iceland**

Regarding the Icelandic cod stock the Icelandic Government adopted a new management plan for the Icelandic cod stock for five fishing years, starting by the 2009/2010 fishing season. The main objective of the management plan is to ensure that the spawning stock biomass (SSB) will with high probability (> 95 %) be above the present size by the year 2015. The management plan applies a harvest control rule to calculate the total allowable catch (TAC). ICES has advised that this management plan has a high probability of increasing the size of the spawning stock and that the plan is consistent with the precautionary approach. In addition the fishing mortality is consistent with international commitments to achieve maximum sustainable yield.<sup>4</sup>

## **6. Conclusion on overall status**

Most cod stocks are seriously overexploited or depleted by fisheries throughout its distribution range in the OSPAR Maritime Area. Fisheries management has not always been in line with advice provided by ICES.

As a result of specific recovery programmes for cod stocks, fishing pressure is falling slightly too significantly in several OSPAR Regions. Despite this improved management, most stocks continue to be outside safe biological limits, and current management measures are probably not sufficient for cod stock recovery in all cases.

In the OSPAR List of threatened and/or declining species and habitats, only Regions II and III were originally identified where the feature is under threat and/or in decline, with a footnote specifying this listing as applying to the populations/stocks referred to in ICES advice as the "North Sea and Skagerrak cod", "Kattegat cod", "Cod west of Scotland", "Cod in the Irish Sea", "Cod in the Irish Channel and Celtic Sea".

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<sup>3</sup> Further information on the Norwegian management system and measures can be obtained at <http://www.regjeringen.no/en/dep/fkd.html?id=257>

<sup>4</sup> Further information on the Icelandic management system and measures can be obtained at [www.fisheries.is](http://www.fisheries.is), while further information on the Icelandic cod stock is available at [www.hafro.is](http://www.hafro.is)



However, following the precautionary approach and considering the recent ICES evaluation of the cod stocks in the North-East Atlantic (see 3.3; ICES 2009a) it is suggested to also specify Region I as an area where the species is threatened and/or declining in the following stocks referred to in the ICES advice: “Norwegian coastal waters cod”, “Faroe Plateau cod”, “Faroe Bank cod”.

## 7. Action to be taken by OSPAR

The conservation objectives for this species should be set on the basis of ICES advice and according to the long-term management plan for cod stocks, if applicable, in order to enable in the first place the threatened and/or declining stocks to recover.

All cod stocks, apart from the cod in the Celtic Seas, are already subject to management plans and several, including North Sea cod and Irish Sea cod, have recovery plans in place that focus on reducing fishing mortality.

ICES did not consider that listing by OSPAR would aid the recovery of these cod stocks as the above measures fall within the remit of fisheries organisations (ICES, 2002a).

### **Action/measures that OSPAR could take, subject to OSPAR agreement**

As set out in Article 4 of Annex V of the Convention, OSPAR has agreed that no programme or measure concerning a question relating to the management of fisheries shall be adopted under this Annex. However where the Commission considers that action is desirable in relation to such a question, it shall draw that question to the attention of the authority or international body competent for that question. Where action within the competence of the Commission is desirable to complement or support action by those authorities or bodies, the Commission shall endeavour to cooperate with them.

Scientific advice on the management of this species is available from ICES. This is being implemented, at least in part, by NEAFC, Iceland, Norway and the European Union.

It is therefore proposed that OSPAR should encourage relevant Contracting Parties (Range States and those whose flag vessels are engaged in fisheries that capture *Gadus morhua*) to adopt, or support management consistent with ICES advice for the stocks which are on the OSPAR list, so as to rebuild the cod stocks in the OSPAR Maritime Area to within safe biological limits..

Furthermore, OSPAR may, in particular, consider supporting fisheries management measures through the protection of critical habitats for this species and through the promotion of relevant research.

**Table 4:** Summary of the key priority actions and measures which could be taken for Atlantic cod (*Gadus morhua*). Where relevant, the OSPAR Commission should draw the need for action in relation to questions of fisheries management to the attention of the competent authorities. Where action within the competence of the Commission is desirable to complement or support action by those authorities or bodies, the Commission shall endeavour to cooperate with them.<sup>5</sup>

<b>Key threats</b>	Fisheries mortality (target and by-catch) in unsustainable fisheries	
<b>Other responsible authorities</b>	EC and Council of Fisheries Ministers (Common Fisheries Policy, Regulations, TACs) NEAFC Contracting Parties OSPAR Contracting Parties ICES	
<b>Already protected? Measures adequate?</b>	Council Regulation (EC) No 1342/2008 of 18 December 2008 establishing a long-term plan for cod stocks and the fisheries exploiting those stocks and repealing Regulation (EC) No 423/2004	Long-term management plan for the recovery of the cod stocks in the (a) Kattegat, (b) North Sea, Skagerrak, eastern Channel, (c) west of Scotland; and (d) Irish Sea, jointly agreed by the EU and Norway and in force since 1 January 2009.  Too recent to allow for a comprehensive assessment of its effectiveness.
	Total Allowable Catches and by-catch quotas	TACs have been reduced in several regions and set in line with the provisions of the long-term management plan.
	Fishing effort limitations	Effort is limited for all vessels fishing in the area of the long-term management plan and reduced as fishing mortality for the group of vessels which have the most impact on cod.
	Catch composition rules and mesh size	EU regulation 850/98 defined mesh size and catch composition in particular for cod.
	High-grading ban	A high-grading ban on cod has been introduced in 2009 in the North Sea and eastern Channel and in 2010 in all areas
	Minimum landing size	EC Regulation 850/98 defined the minimum landing size for cod at 35 cm (30 cm in Kattegat and Skagerrak).
	Trimestriell management of cod TAC in North sea and Skagerrak	EC Regulations 23/2010 and 43/2009 introduce obligation of a trimestriell management of cod in the North Sea and Skagerrak. Selective gears have to be used if the targets are surpassed.
	Real time closures (RTC)	RTC are implemented in the North Sea.
	Marine Protected Areas	Several Contracting Parties have established MPAs; however, these have not been set up specifically for protecting cod against impacts from fisheries.  Inside the Norwegian EEZ there are, however, regulatory measures in a number of geographically defined boxes along the coastline prohibiting the use of certain gears during specific time periods of the year, and thus protecting

<sup>5</sup> Table 4 on priority actions and measures for Atlantic cod is only referring to the cod stocks identified in the OSPAR List of threatened and/or declining species and habitats; i.e. North Sea and Skagerrak cod stock, Kattegat cod stock, Cod west of Scotland, Cod in the Irish Sea, Cod in the Irish Channel and Celtic Sea.

		coastal cod and the spawning areas.
<b>Recommended Actions and Measures</b>	<b>OSPAR Commission</b>	<ul style="list-style-type: none"> <li>▪ Monitor information regarding status of Atlantic cod stocks and corresponding advice from ICES and bring this to the attention of CPs.</li> </ul>
	<b>Contracting Parties</b>	<ul style="list-style-type: none"> <li>▪ Adopt ICES advice;</li> <li>▪ Support ICES advice in the Council of Ministers;</li> <li>▪ Identify and protect critical habitats (in particular nursery grounds and spawning aggregations) against adverse impacts from fisheries;</li> <li>▪ Strictly enforce fishery regulations; and</li> <li>▪ Support research on: Life history and trend data; discard data and by-catch survival studies; natural mortality rates; growth parameters and other biological data; spawning grounds; modelling impact of maximum landing sizes upon stock recovery; evaluate impact of real time closures (RTC) on cod recovery and reduction of fishing mortality; and modelling impact of zero catch zones (e.g. MPAs) on stock recovery.</li> </ul>

**Brief summary of proposed monitoring system (see annex 2)**

Fishery-independent surveys are already monitoring this species and landings are recorded, primarily at species level. More information is required on discards.

## Annex 1: Overview of data and information provided by Contracting Parties

<b>Contracting Party</b>	<b>Feature occurs in CP's Maritime Area</b>	<b>Contribution made to the assessment (e.g. data or information provided)</b>	<b>National reports References or weblinks</b>
Belgium	Y		
Denmark	Y		
France	Y		
Germany	Y	Compilation of Background Document	Eschmeyer, W.N. & Fricke, R. (eds.) 2009; Fricke, R. 1987; Fricke, R. 2007; Fricke, R. (ed.) 2007; Froese, R. & Pauly, D. 2003; Froese R. & Pauly, D. (eds) 2009
Iceland	Y		
Ireland	Y		
Netherlands	Y	Review of Draft Background Document (by IMARES)	
Norway	Y		
Portugal	N		
Spain	N		
Sweden	Y	Review of Draft Background Document	Knutsen et al. 2003; Svedäng 2003
UK	Y	Review of Draft Background Document (by CEFAS)	

## Annex 2: Description of the proposed monitoring and assessment strategy

### Rationale for the proposed monitoring

Continued monitoring is essential to provide management advice and to evaluate future trends, including by-catch and stock recovery following cessation of target fisheries.

### Use of existing monitoring programmes

Regular fishery independent surveys are undertaken by research vessels and chartered vessels in the OSPAR Maritime Area and landings data are collected at species level.

### Synergies with monitoring of other species or habitats

Monitoring of other demersal fish species on the OSPAR List require the same strategy.

### Assessment criteria

It is not considered necessary to develop assessment criteria or triggers for additional monitoring of this species at the present time.

### Techniques/approaches

As already underway, with the addition of improved discard reporting, discard survival studies in collaboration with industry, and collection of additional biological data.

### Selection of monitoring locations

Should include critical areas (e.g. spawning and nursery grounds).

### Timing and Frequency of monitoring.

As already underway.

### Data collection and reporting

As already undertaken with improvements as required.

### Quality assurance

n/a

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